

The B-SMART Appropriate Medication-Use Process: A Guide for Clinicians to Help Patients— *Part 1: Barriers, Solutions, and Motivation*

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Introduction

Five Case Examples

1. AJ, a woman, age 57 years, was diagnosed with hypertension and given a prescription for Lisinopril. After one week, she stopped taking the medicine because she was too dizzy to focus at work. Six months later, she was taken to the Emergency Department with a severe headache and blood pressure reading of 210/100.
2. SB, a toddler age two years, was diagnosed with an ear infection. Her mother was told to give her a teaspoon of an antibiotic twice daily. So, twice a day, the mother poured a teaspoon of the medicine into her daughter's ears.
3. A man, age 62 years, stopped taking his atenolol because he did not like how it made him feel. Thirty-five days later, he was readmitted to the hospital with a second heart attack.
4. A man, age 37 years, got a prescription for nicotine patches to help him quit smoking. He plastered the nicotine patch on his mouth.
5. A woman, age 25 years, with depression stopped taking her Prozac because she did not feel better after two weeks. Her clinician

did not tell her that it may take four to six weeks to feel the full effects of the medication.

Reasons for Misuse

These are only a few examples of the thousands of people who fail to achieve the desired therapeutic outcomes from their medications because they are not taking them appropriately. Reasons include a lack of knowledge about the medication; side effects or adverse events; forgetfulness; lack of social support; cultural, health and/or religious beliefs; denial of conditions; financial challenges; poor relationships with clinicians; and lack of health literacy.¹

Chronic Conditions

In patients with chronic conditions who must take medications for long periods of time, misuse is especially prominent—37%-80% vary from prescription—resulting in an increase of the following: risk of mortality and morbidity; hospitalizations and length of stay, especially in patients with multiple disease states; progression of disease in patients with chronic conditions; resistance to medications; and a loss of productivity at school and work.²

In 2001, one in two prescriptions dispensed, or 1.5 billion prescriptions, were not taken as directed.³

Cost of Adverse Events

According to the Centers for Disease Control and Prevention and the Care Management Society of America, medication-use challenges and adverse medication events are the fourth leading cause of death in the US—after heart disease, cancer, and stroke; they are also the leading cause of accidental death in the US—ranking above motor vehicle accidents.⁴ Economically, medication-use challenges and poor adherence to cardiovascular treatments costs the US health care system an estimated \$100 billion annually.⁵ Nearly 10% of hospital admissions have been attributed to medication-use challenges, of which 2%-5% were preventable.⁶ An estimated one in five elderly patients (23%) who enter nursing homes are there because they cannot or will not manage their medication appropriately.⁶

Adverse Outcomes

Clinically, variations of medication use from prescription adversely affect patient outcomes; for example,

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Table 1. Elements of multifaceted approaches
Positive relationships and quality of the clinical environment
Ongoing reinforcement, motivation, and support at every step in the health care system
Simplifying dosage regimens
Involving patients in the decision-making process and setting goals that are later reviewed with the patients
Education about the medication, its benefits, side-effect management, duration of therapy, and what a patient can expect
Follow-up care and reminders
Rewards for achieving goals
Social support, including family members when possible
Self-management training

heart failure patients who don't take their medications as prescribed have a two-fold increase in adverse outcomes. Beta-blocker nonadherence in patients with coronary artery disease increases mortality 4.5 times.⁷ Medication use challenges increase hospitalizations and length of stay for patients with multiple disease states and can cause disease progression. For example, hypertension can progress to an acute myocardial infarction. Medication use challenges significantly affects our health care systems and our economy.⁸ Conversely, the Heart Outcomes Prevention Evaluation study, the Scandinavian Simvastatin Survival Study Group research, and other studies have demonstrated significant improvement in mortality, by up to 40%, when medications are used appropriately.^{9,10}

Improving appropriate medication use can positively affect patient care, health care outcomes, and can significantly reduce costs for

patients and the health care industry. However, patient compliance in medication use is difficult to achieve because the reasons patients are noncompliant are varied, thus multifaceted solutions must be found and implemented. Studies have shown that multifaceted, ongoing approaches improve medication use and achieve better therapeutic outcomes than single, ongoing interventions or one-time approaches such as shown in Table 1.¹¹⁻¹⁴

The B-SMART Appropriate Medication Use Process

We present here, in two parts, the B-SMART (Barriers, Solutions, Motivation, Adherence Tools, Relationships, and Triage) Appropriate Medication Use Process, a multifaceted approach that combines many of the elements listed in Table 1. Used before, during, and after any clinician-patient interaction this

process creates a consistent method to help patients more effectively use their medications.

Part one will address the barriers, solutions, and motivations in appropriate medication use. Part two, which will appear in the Spring 2009 issue of *The Permanente Journal*, will discuss adherence tools, relationships, and triage.

Barriers: Identify barriers and assess readiness to change

How to Identify Barriers—

Identifying the barriers to a patient's appropriate medication use is the first step to determining what interventions a clinician may use for that particular patient. Key barriers may be patient related, medication related, or clinician related (Table 2). A good rapport between the patient and the clinician is critical to adherence. Patients must feel comfortable about asking prescription-related questions, otherwise they will not ask.

Clinicians must first understand why a patient is not taking his or her medications properly. Some questions to better understand the patient include (depending on the situation):¹⁵

1. During the last week, how many days have you missed taking any of your medications?
2. During the last week, what percentage of your medications have you taken?

Table 2. Barriers to appropriate medication use and adherence		
Patient-related barriers	Medication-related barriers	Clinician-related barriers
Forgetfulness	Complex medication regimens	Poor relationship with clinician
Lack of knowledge about medication and its use	Side effects or adverse effects from the medication	Poor communication with clinician
Cultural, health, and/or religious beliefs about the medication	Taking multiple medications at the same time	Cultural, health, and/or religious beliefs—disparity between clinician and patient
Denial or ambivalence regarding conditions	Length of therapy	Lack of feedback and ongoing reinforcement from clinician
Financial challenges		
Lack of health literacy		
Lack of social support		

READINESS ASSESSMENT RULER												
Circle one answer for each type of drug												
Types of medications	Readiness stages											
	Not ready			Unsure			Ready to take action				I do not use this type of medication	
	0	1	2	3	4	5	6	7	8	9		
Medication A	0	1	2	3	4	5	6	7	8	9	10	Don't use
Medication B	0	1	2	3	4	5	6	7	8	9	10	Don't use
Medication C	0	1	2	3	4	5	6	7	8	9	10	Don't use
Medication D	0	1	2	3	4	5	6	7	8	9	10	Don't use

Figure 1. Readiness Assessment Ruler

3. Have you stopped or started taking any of your medications on your own?
4. Have you ever had difficulty taking your medications as prescribed and, if so, why?
5. What gets in the way of taking your medications on some days?
6. What did your doctor tell you this medication is for? (to identify patient's knowledge and purpose of medication)
7. Have you experienced any problems or had any side effects while taking your medications?

Another question set used to screen for appropriate medication use is the Morisky Medication Adherence Scale:¹⁶

1. Do you ever forget to take your medications?
2. Are you careless at times about taking your medications?
3. When you feel better, do you sometimes stop taking your medications?
4. Sometimes, if you feel worse when you take your medications, do you stop taking them?

This question set is rated on a yes-no basis: high adherence = all "no" responses; medium adherence = 1 or 2 "yes" responses; low adherence = 3 or 4 "yes" responses.

When screening for appropriate medication use, communicate in an empathic, nonjudgmental, collaborative way and ask open-ended questions. This will improve the

chance of the patient talking about his/her barriers to medication use as prescribed. Patient responses can guide areas to be addressed and allow collaborative solutions with the patient.

Exploring Readiness to Change—To ensure optimal outcomes, it's critical to assess whether a patient is ready to accept a condition and/or use the prescribed medications as a component of his/her overall health care plan. Assessment is especially necessary in patients who will be taking medications for an extended period of time (for example, antihypertensive medications). The clinician must elicit any and all perceived obstacles to medication adherence. The use of the word "but" is an alert of significant ambivalence. Tools and skills to assess readiness and to motivate patients to optimize their medication use include The Readiness Assessment Ruler (Figure 1).¹⁷ The readiness ruler with a scale from 0–10 is an efficient tool for measuring how a patient feels about taking a medication for a long period of time. Exploring readiness helps the patient uncover and build his/her motivation to change habits and to accept a new therapy; it guides the clinician to effectively tailor the intervention to support movement toward change.¹⁷ Follow-up questions to elicit patient perspective and engage them in planning goals and problem solving include:

1. What is your understanding of the disease or condition you have?
2. What are your personal reasons for wanting to get better, reaching a specific goal concerning your condition, and/or controlling your disease or condition?
3. How can I help you?

Using a nonjudgmental and positive tone will help a patient open up. Avoid the word "why" because it has a judgmental connotation.

Readiness stages—There are three readiness stages: not ready, not sure, and ready to take action (Figure 1):

Not ready (readiness ruler: 0–3): The patient is not even thinking about the need to change. He may respond to these questions by saying, "I don't really have a problem," or "the doctor fixed it already." At this point, it may be best to help the patient become more aware of his or her condition and link disease and consequences, as well as the benefits of early treatment.

Not sure (readiness ruler: 4–6): The patient is considering change but is ambivalent and has not yet taken any action. His responses to these questions may include, "I know I need to take my medication(s) but I don't have the time to change." For these patients, it's best to reinforce their understanding of the need to change while teaching them skills and providing the necessary tools. This is the "yes, but" stage in the change process.

Ready to take action (readiness ruler: 7–10): The patient is ready to make the necessary changes to improve his or her health. These patients need help with goal setting, medication plans, progress diaries, as well as support when pitfalls occur. Reinforcing goals at each visit and providing positive feedback will help improve outcomes. The more positive and encouraging the

clinician, the better the outcome. Ideally, these patients need ongoing motivation, recognition, and rewards. Recognition and rewards can be congratulatory praise, an encouraging word, or even a handwritten note. “Cheerleading” from the clinician at each encounter will help sustain success.

Solutions: *Provide solutions to nine challenges*

Once we have screened for barriers and assessed for readiness, the next step is tailoring the interventions to the identified barrier(s). The consultation should include collaborative solutions, involving patient and clinician, as well as professional advice given in a manner that enhances patient motivation. Discussed below are examples of nine challenges and their corresponding collaborative solutions to optimize the patient’s therapeutic outcomes. Although some barriers are more difficult to detect and assess, successfully identifying them can make a significant difference in patients reaching their goals.

Challenge 1: Forgetfulness: “I forgot to take my medication”—One of the most common reasons for patients not taking their medications appropriately is simple forgetfulness. In a survey conducted in the US in 2005, nearly two-thirds (64%) of patients who were prescribed regular medication reported that they had simply forgotten to take their medication, with 11% saying that this has happened “often” or “very often.”¹⁸ Patients with chronic conditions are more likely to forget, primarily because of the duration of time they have to take the medication (sometimes lifelong), as well as work or school schedules and other activities.

Solution—There are many ad-

herence and memory tools to help patients overcome forgetfulness, which includes remembering to take medications, remembering if they have taken them, and remembering to refill prescriptions. Some collaborative solutions to forgetfulness are:

- Pill organizers and reminders, including electronic devices
- Linking medication regimen to daily habits
- Pharmacy-generated written prescription information
- Visual aids
- Follow-up management in one to two weeks.

Challenge 2: Lack of knowledge: “I don’t know why I have to take this medication” or “I’m not sure it will do me any good”—Helping patients understand the purpose and benefits of their medications can improve their adherence.

Solution—A study concluded there was an association between the occurrence of certain adverse drug outcomes and a patient’s lack of knowledge and poor perceptions about drugs.¹⁹ Providing this information in terms of benefit to the patient (value-added knowledge) is a powerful way of improving patients’ ability to use their medications. A survey of over 1000 adults, who admitted that they did not always take their medications as directed, revealed that 70% of the respondents said that they would be more adherent to their medication regimen if they were better informed about their disease or condition and what the prescribed medication was supposed to do.²⁰ Studies show that a patient knowing the purpose of a medication, how to take a medication, and the duration of therapy, whenever possible, is vital to helping that patient obtain the optimal outcome from a medication.²⁰ Some collaborative solutions to lack of knowledge are:

- Pharmaceutical pearls to help patient understand the benefits of the medication
- Pharmacy-generated written prescription information
- Visual aids
- Teach-back method
- Follow-up management in one to two weeks.

Challenge 3: Side effects or adverse events: “I had a stomach ache when I took the medication” or “I could not do my job when I was taking this medication because of the side effects”—Of patients on medications, 20–60% stop taking their medications as prescribed because of side-effect issues. In patients on tricyclic antidepressants, up to 50% stop taking their medications because of the adverse effects.

Solution—Clinicians should proactively inform patients about common side effects, what they can do to minimize them, and how long the side effects may last. Patients will be empowered by knowing what to expect and what to do when they experience the side effect. Ultimately, this solution will improve their adherence to their medication regimen. Some collaborative solutions to management of side effects are:

- Pharmacy-generated written prescription information
- Pharmaceutical pearls about side-effect management
- Follow-up management in one to two weeks.

Challenge 4: Complex medication regimens: “I am taking too many medications and I cannot remember how to take them”—In a Kaiser Family Foundation and Commonwealth Fund survey, 46%

In a Kaiser Family Foundation and Commonwealth Fund survey, 46% of nearly 18,000 seniors took five or more prescriptions daily.²¹ ... and 4 in 10 seniors do not take medications as prescribed ...

of nearly 18,000 seniors took five or more prescriptions daily.²¹ Patients with multiple chronic conditions can take up to ten different medications daily. It is no wonder a significant number are confused about taking them properly. The number of times the medication is taken daily can compound nonadherence. According to one study, there is a direct correlation between the dosing frequency and level of adherence—as dosing frequencies increase, adherence decreases steadily.²²

Solution—When designing medication regimens, consider frequency, dosage, and the patient's lifestyle; eg, if the patient works at night and sleeps during the day, medications that generally make a patient drowsy and are recommended for evening use may need to be switched to daytime. Some collaborative solutions to management of complex medication regimens are:

- Adherence tools; eg, pill boxes and reminder calls
- Combination medications to simplify regimens, for example, Metaglip [glipizide (Glucotrol) and metformin (Glucophage)]
- Frequency of dose modification
- Help patients make associations, linking medication use with daily habits
- Follow-up management in one to two weeks.

Challenge 5: Denial of conditions: “I am not really sick” or “I do not need this medication”—Patients who have been newly diagnosed with a chronic condition may be in denial or have significant ambivalence about taking medications; as many as 50% of all prescriptions written at Kaiser Permanente go unfilled. Also, patients who have been on long-term medications for chronic conditions and are not experiencing symptoms sometimes

feel that they no longer need to take their medications. Motivational Interviewing for health behavior change tools are most helpful.

Solution—Assessing whether or not newly diagnosed patients are ready to accept their condition and/or use the prescribed medications as a component of their overall health care plan is an important step in ensuring optimal outcomes. Some collaborative solutions for addressing denial of conditions are:

- Explore readiness to accept the disease condition
- Educate about the disease condition
- Provide pharmaceutical pearls to help patient understand the benefits of the medication
- Follow-up management in one to two weeks.

Challenge 6: Cultural or religious biases: “I do not believe in taking this medication” or “I do not need this medication”—In some cultures, diseases are looked upon as “punishment by God” for breaking religious tradition, or as a curse from another person or supernatural entity. In these cases, a person believes that taking western medication may not work to control or heal the disease. Also, a medication's name, such as “human

insulin,” may be misunderstood by the patient as signifying manufacture from human flesh or pancreas, leading to noncompliance.²³ Each person comes to the encounter with a highly personal belief set about care and medications.

Solution—If clinicians have long-term relationships with their patients, they may wish to be acquainted with their patients' religious and cultural practices. This may help them anticipate and develop insight into potential conflicts between adherence to treatment and adherence to theological obligations. Some collaborative solutions for addressing cultural or religious biases are:

- Using the LEARN framework to explore and understand patients' beliefs (see Sidebar: LEARN Framework)²⁴
- Provide pharmaceutical pearls to understand the benefits of the medication
- Follow-up management in one to two weeks.

Challenge 7: Lack of financial support: “This medicine is too expensive” or “I cannot afford this medication”—Research has shown that cost of medications is associated with medication adher-

LEARN Framework

L – Listen with empathy and understanding to the patients' beliefs.

E – Explore and understand the patient's beliefs (utilize an interpreter when needed) and explain your perceptions of the problem.

A – Acknowledge and discuss the similarities and differences between the clinician and patient's beliefs. Be respectful of the patient's beliefs; do not discount what the patient is saying, especially if s/he believes it's working.

R – Recommend treatment. On the basis of these insights, develop a medication plan that will minimize these conflicts. Whenever possible, offer patients the counsel and information necessary to maintain both their faith and their health.

N – Negotiate an agreement. When appropriate, include family members in mediation discussions and stress the importance of family support in long-term chronic conditions.

ence. In a national survey of 875 adults with diabetes treated with hypoglycemic medication, 11% reported taking less medication because of cost.²⁵ In addition, patients who have transportation issues or cannot financially take time off from work to pick up prescriptions may not adhere to their medication regimen.

Solution—Inquiring about patients' copay amounts and/or their ability to pay for medications is important to helping their adherence. Some collaborative solutions for addressing financial limitations are:

- Prescribing generic drugs rather than brand names
- Mail-order drug discount programs
- Medical financial assistance
- Pharmaceutical company programs.

Challenge 8: Depression—Depressive symptoms have been significantly associated with medication nonadherence.²⁶ Depressed patients are more than twice as likely not to take their medications as prescribed, which prevents them from receiving the medication's benefits.²⁷ Other studies have shown that patients who are depressed have a 70% increased rate of CHD events, including nonfatal myocardial infarction and CHD death, compared with those who are not depressed.

Solution—Identify and address underlying depressive symptoms by using assessment tools: Center for Epidemiologic Studies Depression (CES-D) Scale Mood Evaluation, the Geriatric Depression Scale (GDS), the Patient Health Questionnaire (PHQ9, PHQ2), and the Beck Depression Inventory for Primary Care (BDI-PC).

- Identify depressive symptoms
- Use available tools to assess effectiveness of psychological and/or medication treatments

- Follow-up management in one to two weeks.

Challenge 9: Poor health literacy—Health literacy is a constellation of skills that constitutes the ability to perform basic reading and numerical tasks for functioning in the health care environment and acting on health care information.²⁸ Low health literacy is common in the US, affecting nearly 90 million adult Americans. Low health literacy results in difficulty understanding and acting upon health information, and, according to the Institute of Medicine report,²⁹ costs the American health care system about \$58 billion per year.³⁰ This can adversely affect the clinician-patient relationship, leading to substandard medical care and poor understanding of written or spoken medical advice, adverse health outcomes, and a negative effect on the health of the population.³¹

A study of Medicare enrollees in a national managed care organization showed that 54.3% of enrollees with inadequate literacy levels did not know how to take medications on an empty stomach.³² In a study of 114 patients with diabetes, researchers found only half of those with inadequate health literacy knew the symptoms of hypoglycemia, or low blood sugar.³³ Research also suggests that people with low health literacy make more medication or treatment errors and are less likely to comply with recommended treatment.³² In fact, an American Medical Association committee report showed that health literacy correlates more strongly with overall health status than education level or any other sociodemographic variables,³² including income. Additional health literacy information can be found at: http://ambulatorypractice.org/dls/Health_Literacy/start.htm.

Solution—Improve patients' health literacy by helping them to understand how to use their medications and how their medications work.

- Provide pharmaceutical pearls to help patient understand the benefits of the medication
- Provide interpreter services for patients who do not speak English
- Provide patient medication information at the fourth-grade level
- Use nonmedical language and speak slowly
- Provide information in an organized manner
- Use visual aids whenever possible
- Use the "teach-back method" to check for comprehension.

Motivation: Helping patients help themselves

To motivate people to change, we must first help them recognize their personal benefits to making a health-activity change. This can be done by linking the problem to things they care about, while maintaining a warm, nonjudgmental style of interaction. For example, when exploring readiness to change, a clinician may discover that the patient hopes to live long enough to see the birth of his or her grandchildren. This deep personal desire can encourage patients to take medications consistently, to change their diet, and to exercise. It can also be linked to specific health goals, for example, in a diabetic patient—getting HgA_{1c} to under 7. Whatever health goal is set, the patient is more likely to follow through on the necessary health behaviors that will make that goal a reality if it's linked to strong personal motivators.

Goal setting—People who write out their goals and have an action plan are as much as ten times more likely to achieve their goals than those who only think about them. To help patients appropriately use

their medications, clinicians should set clear health goals in a collaborative manner and encourage patients to write these down. Each time the patient has contact with a clinician on his or her health care team, that clinician should review these health goals and provide feedback.

Set goals in stages so patients can celebrate every small step that is achieved toward their larger goal. For obese patients, this could be setting a small goal of losing 10% of their body mass. For patients who are physically inactive, an initial goal could be to walk a short distance every day for a week, building up to a mile or more. For a diabetic who forgets to test blood sugar, the initial goal may merely be daily glucose testing; once this is achieved, and is sustained for some time, the patient can move on to other diet and lifestyle changes to support a healthy blood sugar range.

The Three Es: Educating, empowering, and encouraging—Educating patients about their disease conditions and medication treatment plans is essential if patients are to successfully use their medications appropriately to achieve the optimal therapeutic outcomes. Educating patients includes providing concise and focused verbal information about their condition and medication treatment plan and providing written information to reinforce what's been discussed, whenever possible. Behavioral tools, such as follow-up phone calls and reminder postcards, must be used to help patients take their medications as prescribed. Educating patients will empower them to take control of their own health issues. Last but not least, encouragement and support from clinicians and family members will help patients exert greater effort. Clinicians can create a positive interaction that motivates patients to

excel by encouraging goal sharing, setting clear objectives, discussing goals at each visit, and providing positive feedback. The value of a clinician recognizing and acknowledging patients when both small goals, or large milestones, are accomplished cannot be overstated.

Summary

Research shows that the combination of education, empowerment of patients by providing tools and feedback, and ongoing encouragement given to patients will significantly improve adherence to therapy plans and improve outcomes than any one component alone.^{9,12,34}

To complete this B-SMART approach to medication optimization, part 2 of this article in the Spring 2009 issue will discuss: *Adherence Tools*: Tools and reminders to keep patients on track; *Relationships*: Building positive relationships; and *Triage*: Direct patients' medication management plan into the broader health care system. ♦

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How Things Have Changed

"Six of the patients have died, sir," said the hospital nurse to the physician, as he went on his rounds. "Why, I wrote the medicine for seven," mused the doctor, passing to another ward. "Yes, but one of them wouldn't take his," was the naïve reply.

—Anonymous, circa 1850